

REMARKS

In the Office Action dated May 17, 2004, the restriction requirement was made final; and the rejections from the previous Office Action (dated December 2, 2003) were maintained.

RESTRICTION REQUIREMENT

A petition challenging the restriction requirement was previously submitted on July 19, 2004 (copy attached for the convenience of the Examiner). As discussed in the petition, the restriction requirement is in error and should be withdrawn. Applicant respectfully requests that claims 6-10, 16, 20, 22, 23, 27-39, and 43 should remain in the application and should not be withdrawn.

REJECTIONS UNDER 35 U.S.C. §§ 102 AND 103

In the previous Office Action dated December 2, 2003, claims 1, 4, 5, 14, 15, and 25 were rejected under 35 U.S.C. § 102 over U.S. Patent No. 6,144,553 (Hileman); claims 11, 17-19, and 21 were rejected under § 103 over Hileman in view of U.S. Patent No. 6,152,213 (Suzuki); claims 12, 13, and 26 were rejected under 35 U.S.C. § 103 over Hileman in view of U.S. Publication No. 2003/0075312 A1 (Panek); and claims 2 and 3 were rejected under § 103 over Hileman in view of U.S. Publication No. 2003/0056938 A1 (McCullough).

It is respectfully submitted that Hileman does not disclose the subject matter of claim 1. Claim 1 recites a heat sink assembly including a heat conduit, a block formed of a thermally conductive material having a first thermal conductivity, and a heat conduit extending through a substantial portion of the block. The Office Action identified heat pipe 110 depicted in Figures 5 and 6 of Hileman as teaching the heat conduit of claim 1, and identified head disk assembly 130 as being the block recited in claim 1. Note that the head disk assembly 130 is part of a disk drive 102.

The present Office Action indicated that the thin conduction plates 104 of Hileman are also part of the head disk assembly 130. The present Office Action indicated that the claim 1 elements are satisfied by the heat pipe 110 of Hileman being connected to a thin conduction plate 104. Applicant respectfully disagrees with this assessment. As seen in Figure 7 of Hileman, each heat pipe 110 is a short stub that has one end connected to a back plane 106. The other end of the short heat pipe 110 is connected to a thin heat conduction plate 104, better shown in Figure 6 of Hileman. The connection of each heat pipe 110 to a *thin* conduction plate 104, as

taught by Hileman, is *not* the same as extending a heat conduit *through a substantial portion of* the plate 104. The plate 104 of Hileman is rather thin, almost as thin as each heat pipe 110 (as shown in Figures 6 and 7 of Hileman). Therefore, the heat pipes 110 do *not* extend *through a substantial portion of* each plate 104.

Moreover, the length of the heat pipe 110 is much shorter than the length of the conductive plate 104 (as shown in Figures 6 and 7 of Hileman). Thus, even if the heat pipe 110 of Hileman were to be bored into the thin conduction plate 104, the heat pipe 110 would not be able to extend through a *substantial* portion of the thin conduction plate due to the relative lengths of the heat pipe 110 and the thin conduction plate 104. For this additional reason, claim 1 is not anticipated by Hileman.

Independent claim 24 is also not disclosed by Hileman, since Hileman does not teach extending an elongated heat conduit through a substantial portion of a block. Again, all that is disclosed in Hileman is one end of a heat pipe 110 connected to a back plane 106, and the other end of the heat pipe 110 connected to a thin conduction plate 104.

Independent claim 31<sup>1</sup> recites a heat sink having a block formed of a thermally conductive material, with the heat sink having a first segment and a second segment. The heat sink further includes a heat conduit extending *through the block* between the first and second segments, with the first segment to transfer heat from the heat conduit in a first direction, and a second segment to transfer heat away from the heat conduit in a second direction. Such a feature is not disclosed by Hileman.

Dependent claims (including newly added dependent claim 44) are allowable for at least the same reasons as corresponding independent claims.

Claim 11 (which depends indirectly from claim 1) was rejected as being obvious over the asserted combination of Hileman and Suzuki. Applicant respectfully submits that the asserted combination of references does not teach or suggest the subject matter of claim 11. The Office Action cited Figures 15a, 15b, and 15c of Suzuki as disclosing the block with airflow channels. Note, however, that the airflow channels disclosed in Figures 15a and 15b are part of a heat sink 10 with a cooling fan that has a heat sink plate 12. Suzuki, 1:30-31. The dense electronic package 20 is attached to the heat sink plate 12. There is no indication whatsoever that heat

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<sup>1</sup> Claim 31 was incorrectly indicated by the Examiner as being withdrawn. Applicant respectfully submits that claim 31 should not be withdrawn, as explained by the Petition submitted previously.

pipes can extend into the heat sink 10. Therefore, the hypothetical combination of Hileman and Suzuki fails to disclose the following element of claim 11: an assembly having a block and a heat conduit extending through a substantial portion of the block, where the block has airflow channels to provide surfaces on the block exposed to airflow. Although the heat sink 10 of Suzuki has airflow channels, there is no suggestion whatsoever within Suzuki or Hileman that airflow channels can be provided in a heat sink through which a heat conduit extends. Therefore, a *prima facie* case of obviousness has not been established with respect to claim 11.

In response, the present Office Action remarked that "applicant claims that the block has airflow channels to provide surfaces on the block exposed to airflow in which Suzuki '213 does (see Figures 15a, 15b, and 15c)." 5/17/2004 Office Action at 3. This comment does not paint the whole picture of claim 11, where the block that has the airflow channels must also be the block through which the heat conduit extends. It is noted that although the heat sink 10 of Suzuki has airflow channels, there is absolutely no suggestion whatsoever within Suzuki, or Hileman, that airflow channels can be provided in a heat sink through which a heat conduit extends. Therefore, even if Hileman and Suzuki can be combined, the asserted combination of Hileman and Suzuki fails to teach or disclose *all* elements of the claim. A *prima facie* case of obviousness has thus not been established with respect to claim 11.

Claims 17-19 and 21 were also rejected as being obvious over the asserted combination of Hileman and Suzuki. Because the rejection of the base claim (claim 1) over Hileman is defective, it is respectfully submitted that the obviousness rejection of claims 17-19 and 21 over Hileman and Suzuki is also defective.

Similarly, because the rejection of base claim 1 over Hileman is defective, the obviousness rejection of claims 2 and 3 over Hileman and McCullough is also defective.

The obviousness rejection of claims 12 and 13 over Hileman and Panek is also defective because the rejection of base claim 1 over Hileman is defective. Similarly, the obviousness rejection of claim 26 over Hileman and Panek is defective because the rejection of base claim 24 is defective.

Allowance of all claims is respectfully requested. The Commissioner is authorized to charge any additional fees and/or credit any overpayment to Deposit Account No. 14-0225 (9926).

Respectfully submitted,

Date: Feb. 16, 2005

  
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<p><b>Fax</b></p> <table border="1"> <tr> <td>To:</td> <td colspan="3">Mail Stop Petitions</td> </tr> <tr> <td>Company:</td> <td colspan="3">FAX: Dan C. Hu</td> </tr> <tr> <td>Fax:</td> <td colspan="3">Date: July 19, 2004</td> </tr> <tr> <td>Your Ref:</td> <td colspan="3">Pages: 4 (including cover sheet)</td> </tr> <tr> <td colspan="2">Your Ref: 10/016,624</td> <td colspan="2">Our Ref: 9926 (NCR.0057US)</td> </tr> <tr> <td colspan="4"> <p>Attorney Docket No: 9926 (NCR.0057US) Date: July 19, 2004</p> <p>DOcket No:</p> <p>Applicant(s): DAVID G. WANG and P. KEITH MULLER Serial No.: 10/016,624 Filing Date: December 10, 2001 Title: HEAT SINK FOR ENHANCED HEAT DISSIPATION</p> <p>1. Petition to Traverse Restriction Requirement</p> </td> </tr> </table> <p>© Notices: This information is intended to be for the use of the individual or entity named on this transmittal sheet. If you are not the intended recipient, be aware that any disclosure, copying, distribution, or use of the contents of this faxed information is prohibited. If you have received this facsimile in error, please notify the sender by telephone immediately so that arrangements can be made for the retrieval of the original document at no cost to you.</p>				To:	Mail Stop Petitions			Company:	FAX: Dan C. Hu			Fax:	Date: July 19, 2004			Your Ref:	Pages: 4 (including cover sheet)			Your Ref: 10/016,624		Our Ref: 9926 (NCR.0057US)		<p>Attorney Docket No: 9926 (NCR.0057US) Date: July 19, 2004</p> <p>DOcket No:</p> <p>Applicant(s): DAVID G. WANG and P. KEITH MULLER Serial No.: 10/016,624 Filing Date: December 10, 2001 Title: HEAT SINK FOR ENHANCED HEAT DISSIPATION</p> <p>1. Petition to Traverse Restriction Requirement</p>			
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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: David G. Wang et al. § Group Art Unit: 3743  
§  
Serial No.: 10/016,624 §  
§ Examiner: Niher B. Patel  
Filed: December 10, 2001 §  
§  
For: Heat Sink For Enhanced Heat § Atty. Dkt. No.: 9926 (NCR.0057US)  
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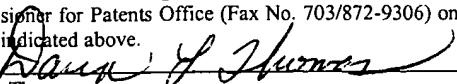
### PETITION TO TRAVERSE RESTRICTION REQUIREMENT

Dear Sir:

The following restriction requirement, now made final, is currently asserted against the present application:

Specie I: Figure 2;  
Specie II: Figures 3-5;  
Specie III: Figure 6.

Figure 2 illustrates a system having heat producing devices with heat sinks mounted on the devices. Specification, ¶ [0007]. Figure 3 shows a portion of a heat sink 106 or 108 used in the system of Figure 2. Specification, ¶¶ [0025]-[0027]. Figure 4 shows the remaining portion of the heat sink 106 or 108, namely heat block 120. Figure 5 is a cross-sectional view of the heat sink of Figure 4. Specification, ¶ [0010]. Figure 6 illustrates an example heat pipe useable in the heat sink of Figure 4. Specification, ¶ [0010].

Date of Deposit:	July 19, 2007
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Dawn L. Thomas	

Figures 3, 4, 5 are detailed depictions of portions of heat sinks used in the system of Figure 2. Therefore, Figures 3, 4, 5 should not be identified as a specie distinct from Figure 2.

As stated by the MPEP, claims to be restricted to different species must be mutually exclusive. MPEP § 806.04(f) at 800-41. The general test as to when claims are restricted, respectively, to different species is the fact that one claim recites limitations which under the disclosure are found in a first specie but not in a second, while a second claim recites limitations disclosed only for the second specie and not the first. *Id.* Here, the features of Figures 3, 4, and 5 are found in the heat sinks 106 and 108 depicted in Figure 2. Therefore, the test of mutual exclusivity necessarily fails. Reversal of the restriction requirement is respectfully requested.

The "specie" of Figure 2 (elected by Applicant) has two types of heat sinks: (1) the heat sink 108 connected to heat pipes 107; and (2) heat sinks 106. The details of each of the heat sinks 106 and 108 are depicted in Figures 3, 4, 5. By electing the specie of Figure 2, Applicant has elected claims readable on a system having heat sink 106 and heat sink 108 (with respective embedded heat pipes). It is respectfully submitted that *all* pending claims 1-43 are readable on the elected "specie" of the Figure 2. In view of this, the Office Action has incorrectly indicated that claims 6-10, 16, 20, 22, 23, 27-39, and 43 are withdrawn.

Therefore, it is respectfully requested that the Examiner's restriction requirement be reversed. Please charge any fees for this Petition to Deposit Account No. 50-1673 (9926). The Commissioner is authorized to charge any additional fees, including extension of time fees, and/or credit any overpayment to Deposit Account No. 50-1673 (9926).

Respectfully submitted,

Date: *July 19, 2004*

  
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